

## SOCIO ECONOMIC FACTORS RESPONSIBLE FOR CHILD IMMUNIZATION IN THREE SAARC COUNTRIES: INDIA, BANGLADESH AND PAKISTAN

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### ABSTRACT

It was a comparative study based on the socioeconomic factors that were affecting the participation in the child immunization program. This study was conducted at the Department of Economics GC University Faisalabad from February 2012 to September 2013. To see the effect of socioeconomic factors on child immunization in Pakistan, India and Bangladesh. Data was collected from DHS (Demographic and Health Survey) from year 2006-2007. Following variables were studied: 1. Mother's education 2. Father's education 3. Mother's employment 4. Living standard 5. Residential Area Variables were categorized accordingly. Children vaccinated up to the age of 5-years were included while the older were excluded from the study. Multi logistic model was applied to see the significance of these variables on child immunization. Immunization was better in the children of employed mothers in all selected countries. Uneducated mothers had less likelihood to immunize their children compared to highly educated mothers. Uneducated fathers had less likelihood to immunize their children in all selected countries. Poor people residing in villages had less probability to immunize their children as compared to the rich persons residing in the cities. Education of parents, Mother's employment, Richest and people living in urban area were the factors which were significantly different from uneducated parents, unemployed mothers, poorest and people living in rural areas. These factors should be improved considerably for making planning to achieve optimum results of successful immunization.

**KEYWORDS:** Immunization, Vaccination, Education, Children, Unemployment, Socio-Economic Factors, SAARC Countries

### INTRODUCTION

Economical crises is prevailing universally creating hurdles in the development of the countries. Development is a constant rise in the GDP of a country for a long period of time (Todero, 2011). Human capital is the most important factor, influencing development. Human capital is mainly influenced by two factors education and health (Akram and Faheem, 2007; Idrees, 2010).

Education is the key factor of development. But a person cannot be educated well without a healthy body and mind. At the same time a diseased person cannot be able to perform his duties properly. People all over the world are looking for different factors effecting economy of their countries. Beside other factors, good health of people is one of the key factors in improving the human capital (Idrees, 2010). Physically unhealthy people cannot perform their role in the uplifting of the economy of their nation and increasing incidence of ailing people becomes cause of deficient budget available for other progressive and productive projects. Good physical health can be achieved by elimination of different

diseases at proper time. Different diseases are eradicated or kept under maximum control by two ways, i prevention of disease before its occurrence ie. treatment after its occurrence. Prevention is easy and needs minimal financial expenditures while treatment of diseases is painful, costly and time consuming process involving a lot of manpower, equipment, medicine and different surgical procedures. There are different preventive methods for different diseases (Hong and Banta, 2005).

Besides other, Immunization is one of the most effective and well recognized methods in this context. Human body possesses an immune system which protects it from different diseases by developing antibodies against the causative organisms. One is natural innate immunity which is present by birth and other is acquired which is created afterwards by giving specific attenuated organisms to a person by giving a vaccine. Immunity for different diseases can be achieved in children as well as in adults. The method to create resistance against disease is called as immunization (Guyton and Hall, 2000). Child of today is the adult of tomorrow. Child Immunization is the main focus for preventing the human beings from certain disease all over the world in the form of Expanded Programme of Immunization (EPI). EPI is implemented by WHO in all countries for eradication and control of certain diseases. The vaccines include BCG, Calmette Guerin (BCG), Oral Polio Vaccine (OPV), Diphtheria Pertussis Tetanus (DPT), Measles Mumps Rubella (MMR) (Mangrio et al., 2008).

Millennium Development Goals were formulated in 1990 and it was aimed to achieve these goals in 2015. Due to the importance of immunization in health sector the 5<sup>th</sup> Millennium Development Goal was to improve immunization in the society. Improved immunization is very helpful in decreasing the child mortality. It requires 12 months for the completion of immunization in children. It protects the body against fatal diseases such as tuberculosis, malaria, whooping cough, typhoid, diarrhea etc, (Easterly, 2009). Schedule of child immunization is shown in table 1.

**Table 1: The Schedule of Child Immunization**

Recipient	Age	Vaccine
Infants	Birth	BCG/OPV
	Six weeks	DPT/OPV
	10 weeks	
	14 weeks	
	9 months	Measles vaccine
	14 months	DPT/OPV
Children	5 years	DT vaccine
	10 years	Tetanus
	16 years	

(Source: WHO India 2007)

The main cause of infant mortality in the world is the Vaccine Preventable Diseases (VPD) such as diarrhea, tuberculosis, whooping cough, Pneumonia etc. Pakistan is considered a country where Infant Mortality Rate (IMR) is very high among the Asian countries. In 2006 and 2007 it was about 78 and 94 per 1000 births respectively (Pildat, 2010). In Pakistan 120 children die before reaching the five years of their age due to the less access to vaccination. In addition 40% children in Pakistan are not able to get essential food for their health that is a big dilemma as well (Yasin et al., 2004).

Pakistan, India and Bangladesh are situated in the same geographic region having same environment. Pakistan is not able to eradicate Polio from the country inspite of high availability of medicines in the country due to ineffective immunization programme (Hensy et al., 2000). Similarly situation in Bangladesh is not different. Comparatively EPI was introduced in Bangladesh in 1979 and started its full activities in 1985. The situation of vaccination in Bangladesh is better

than Pakistan but not optimal standards. In 1984 the coverage was less than 10 % but in 1994 it was about 70%. It was a big improvement for Bangladesh in 10 years (Chowdhary et al., 2002).

In India, the situation of immunization is better but it still does not have attained the optimum results of successful immunization according to the EPI (Extended Program on Immunization) which was started in 1978. An important predictor of effective immunization in a child is its timely initiation i.e soon after birth 12 (Patra, 2004). Contrarily the mother's education has an inverse relationship with child immunization. Less educated mothers are more interested in child immunization than the highly educated mothers (Muula, et al. 2009).

Pakistan, India and Bangladesh are the countries which are implementing the immunization program EPI. Regional disparities are more common among people residing in cities. They are showing more sophisticated behavior and take their children to the vaccination centers while the people in villages are less conscious about the immunization program (Chaudary, et al 2002). The success results of such vaccination programs in this region are not as good as are in developing countries due to noncompliance of the people. There are different factors which are responsible for then on compliance. These factors include living standards, mother's education, father's education, mother's employment and residential area (rural/urban). By knowing the impact of the above factors on the success of immunization, significant improvements can be made. This will result in proper planning to enhance human capital, the economical development status of a country and general prosperity of the nation.

**Objectives:** To see the effect of socioeconomic factors on child immunization in three selected countries Pakistan, India and Bangladesh.

## MATERIALS AND METHODS

This study was conducted at the Department of Economics, G. C. University Faisalabad Pakistan from February 2012 to September 2013. It is a comparative study. Demographic and Health Survey of India, Pakistan and Bangladesh have collected data about the different variables all over the countries. Data from the above survey regarding immunization of children up to 5 years of age, who were eligible for immunization, was included in the study. Children above the age of 5 years who were not eligible for immunization were excluded from the study. Data summary is given table 2.

**Table 2: Data Summary Showing Name of the Country, Duration of Data Collection and Sample Size**

Country	Year	Sample
Pakistan	2006-2007	95441
India	2005-2006	109041
Bangladesh	2007	10400

Child immunization was taken as the dependent variable. It was further divided into three categories (1) not immunized (2) partially immunized (3) fully immunized. This variable is constructed by taking the following injections/vaccines into considerations: (1) BCG, (2) Polio1 (3) DPT2, (4) Polio2, (5) DPT3, (6) Polio 3, (7) MMR, (8) Polio 0, (9) HBV1, (10) HBV 2 and (11) HBV3.

Mother's education is the independent variable and it has four categories (0) not educated (1) primary education (2) secondary education (3) higher education and father's education is also categorized as the mother's education. Mother's

employment is divided into two categories, (0) is unemployed and (1) is employed. To check the effect of the living standard wealth index is taken which is divided into five categories (1) poorest (2) poor (3) middle (4) rich and (5) richest. Area business can be seen by taking the variable of a residential area that is divided into two categories (1) rural (2) urban

### Analytical Framework

In this study our predicted model is in three categories so multi logistic model is applied here. The basic equation is given below-

$$Y_{(a,b)i} = \ln \frac{\Pr(Y = a, b)}{\Pr(Y = c)} = \alpha_{a,b} + \sum_{j=1}^J \beta_{(a,b)j} (Z)_{ij} \\ = \alpha + \beta_1 (LS) + \beta_2 (MED) + \beta_3 (FED) + \beta_4 (ME) + \beta_5 (RA)$$

Here  $\alpha$  is a constant and  $\beta$  is a slope co-efficient of the variables that is to be estimated.  $P/1-p$  shows the odd ratio to explain the predictor variable. The variables are interpreted on the basis of their significance level. Odd ratios explain the variables on the basis of child immunization.

### RESULTS AND DISCUSSIONS

Frequency distribution was given below according to the variables. In Pakistan poorest persons were highest in number while in India and Bangladesh the richest persons were highest in number. The ratio of uneducated parents were highest in Pakistan

**Table 3: Variable Distribution in Three Selected Countries**

Description	Category	Pakistan		India		Bangladesh	
		No	Percentage	No	Percentage	No	Percentage
Family Income	Poorest	1915	22.7	1144	19.8	1144	19.8
	Poor	1800	21.3	1196	20.7	1196	20.7
	Middle	1717	20.3	1078	18.6	1078	18.6
	Rich	1568	18.6	1081	18.7	1081	18.7
	Richest	1446	17.1	1289	22.3	1289	22.3
Mother's education	No education	5642	66.8	1552	26.8	1552	26.8
	Primary	1168	13.8	1810	31.3	1810	31.3
	Secondary	1115	13.2	1985	34.3	1985	34.3
	Higher	521	6.2	441	7.6	441	7.6
Father's Education	No education	3101	36.7	1942	33.6	1942	33.6
	Primary	1375	16.3	1633	28.2	1633	28.2
	Secondary	2615	31.0	1502	26.0	1502	26.0
	Higher	1342	15.9	711	12.3	711	12.3
Mother's Employment	Employed	6511	77.1	13996	28.8	4403	76.1
	Not employed	1935	22.9	34675	71.2	1384	23.9
Area	Rural	5509	65.2	30053	61.7	3784	65.4
	Urban	2937	34.8	18618	38.3	2004	34.6

Frequency distribution of three selected countries explained the percentages of people according to the socioeconomic factors. Poorest persons were more in Pakistan while in India and Bangladesh they were comparatively less. The percentage of richest person was also highest in Pakistan. This percentage showed more income inequality in Pakistan. Illiteracy rate in Pakistan was also found to be highest. Females were more empowered in Pakistan due to high percentage of employed mothers. The percentage of people living in villages was almost same in all three countries.

**Table 4: Results for Partial Immunization in Three Selected SAARC Countries**

Dependent Variable	Coefficient	Sig	Odd Ratio	Coefficient	Sig	Odd Ratio	Coefficient	Sig	Odd Ratio
Constant	3.973	.000		3.895	.000		87.572	.000	
<b>Mother's Employment</b>									
MW0	-.410	.000	0.664	-.186	.000	.830	-.534	.000	.587
MW1	0			0			0		
<b>Mother's Education</b>									
MED0	-.972	.002	.378	-.1072	.000	.342	-.616	.098	0.587
MED1	-.443	.183	0.642	-.983	.000	.374	-.165	.651	.848
MED2	-.351	.291	.704	-.732	.000	.481	.048	.889	1.049
MED3	0			0			0		
<b>Father's Education</b>									
FED0	-.076	.795	.965	-.545	0	.580	-.274	.347	.760
FED1	.247	.111	1.280	-.507	0	.603	-.241	.398	.786
FED2	.207	.140	1.230	-.147	.132	.863	-.104	.706	.902
FED3	0			0			0		
<b>Living Standard</b>									
LS 1	-.985	.000	.373	-.1130	.000	.323	-.020	.928	.980
LS2	-.797	.000	.451	-.1107	.000	.331	.008	.971	1.008
LS3	-.925	.000	.396	-.822	.000	.439	-.001	.995	.999
LS4	-.562	.003	.570	-.521	.000	.594	-.015	.943	.985
LS5	0			0			0		
<b>Residential Area</b>									
RA 0	-.270	.007	.763	-.046	.306	.955	-.022	.871	.978
RA 1	0			0			0		

Results of Multi logistic model explained that the women who were less empowered had less attention towards participation in partial child immunization, the probabilities in three countries was 0.664, 0.830 and 0.587. Nath et al (2007) have showed the same results that the employed mothers were more conscious to immunize their children compared to the unemployed mothers. 14 Illiterate mothers due to less knowledge had less attention towards immunization. Their probabilities were 0.378, 0.342 and 0.540 respectively. Singh et al (2012) observed that uneducated low standard women were reluctant to immunize their children. 15.Ibn of et al (2007) found the significant relationship between mother's education and child immunization 16.Yasin et al (2004), Adem et al (2003) and Biswas et al (2001) had the same positive impact as this study had revealed 9,17,18.Similarly illiterate fathers were also not interested in partial immunization of their children. Low standard poorest persons also showed less attention towards participation in partial child immunization. Their probabilities were 0.373, 0.323 and 0.980.Bandhari et al (2007) explained that the rich people had more chances to immunize their children as compared to the poor people 18. The results of Babalola (2008) were similar to this study as they showed significant relationship with Parents income and child immunization. Rural residents had less chances to avail the opportunity of partial immunization of children 20. Comparatively the study by Antai et al (2010) revealed different results, the children living in rural areas had more chances to get immunization as compared to the children living in urban areas 21.

**Table 5: Results for Fully Immunized Children in Three Selected Countries**

Variable	Pakistan			India			Bangladesh		
	Coefficient	Sig	Odd Ratio	Coefficient	Sig	Odd Ratio	Coefficient	Sig	Odd Ratio
Constant	3.802	.000		1.106	.002		12.222	.000	
<b>Mother's Employment</b>									
MW0	-.346	.001	.707	-.284	.000	.753	-.399	.074	.671
MW1	0			0			0		
<b>Mother's Education</b>									
MED0	-1.505	.000	.222	-2.085	.000	.124	-1.586	.001	.205
MED1	-.844	.012	.430	-1.361	.000	.256	-1.020	.024	.361

**Table 5: Contd.,**

MED2	-.627	.061	.534	-.864	.000	.422	-.284	.468	.753
MED3	0			0			0		
<b>Father's Education</b>									
FED0	-.237	.112	.789	-.357	.003	.700	-.932	.022	.394
FED1	.125	.453	1.133	-.142	.235	.868	-.780	.035	.458
FED2	.206	.162	1.229	.031	.766	1.032	-.587	.076	.556
FED3	0	.152	1.263	0			0		
<b>Living Standard</b>									
LS 1	-1.902	.000	.149	-2.222	.000	.108	-.557	.150	.573
LS2	-1.321	.000	.267	-1.919	.000	.166	-.542	.125	.581
LS3	-1.152	.000	.316	-1.178	.000	.147	-.428	.187	.652
LS4	-.575	.003	.563	-.893	.000	.432	-.461	.112	.631
LS5	0			0			0		
<b>Residential Area</b>									
RA 0	-.218	.043	.804	-.003	.341	.957	-.410	.052	.664
RA 1	0			0			0		

Women who were not empowered had less chances to fully immunize their children as compared to the empowered women who had the opportunity to go out and work for the benefit of their family. Illiterate mothers had also less attention towards full immunization of their children. Patra (2006) similarly found that the mother's education had positive impact on child immunization 12. Different studies by Ibn of et al (2007), Jamil et al 1999, Pearce et al 2007, Yadav (2004) had observed the same results 16,22,23,24. Uneducated fathers showed the same attitude and give less attention towards full immunization of their children.

Poorest persons were low standard people and they gave less attention towards immunization because they did not consider it important. Chaudhary et al (2002) found that the poor parents were less likely to immunize their children as compared to the richest person of the society 11. Tinkew and Gordon (2005) had shown the same results. People living in villages had less access to child immunization programme 25.

## SUGGESTIONS

It is suggested that literacy rate should be improved in all segments of the society without gender biased at all age levels.

Education level should be elevated in people living in urban as well as rural areas. Gender discrimination should be removed. Boys and girls should have equal rights to get education and health facilities.

Maximum employment opportunities should be given to the people at large scale without sex discrimination to raise their standards of living.

Immunization system should be improved in rural areas. So the backward people can also get easy access to the immunization programmes.

Government should also add the subject of health at primary level and there should be a chapter of immunization, social and health awareness. Seminars should be conducted on this topic in education institutions, health institutions and different community centers. Health workers and social workers should go door to door to motivate the people in this regard.

Awareness campaigns should be launched at every level by the Government as well as Non government organizations to highlight the importance of child Immunization.

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